

## CLAIMS:

1. A mold having a transfer molding surface of a predetermined shape and is used for press-molding a shaping material into a optical element fixing member, wherein  
5 alignment mark-transfer portion(s) is/are formed on the transfer molding surface in order to obtain a press-molded article having alignment mark(s).
2. A mold according to claim 1, wherein the mold  
10 comprises a base member and a mold release film formed on the surface of the base member, the base member comprising (1) a hard material containing WC or (2) a cermet containing TiN, TiC or  $Al_2O_3$ , and the surface of the mold release film serves as a transfer molding surface.
- 15 3. A mold according to claim 1, wherein the mold comprises SiC or amorphous carbon.
4. A method of producing a mold having a transfer  
20 molding surface of a predetermined shape and is used for press-molding a shaping material into a optical element fixing member, wherein shaping portion(s) for forming alignment mark transfer portion(s) is/are formed by dry-etching on the mold material so that the alignment mark  
25 transfer portion(s) is/are formed on the transfer molding

surface of the mold for obtaining a optical element fixing member and having the alignment mark(s), a mold release film is formed so that the shaping portion(s) is/are covered and that the surface of the mold release film serves as the

5 transfer molding surface, thereby to obtain a mold having the alignment mark transfer portion(s) which comprise the shaping portion(s) and the mold release film covering the surface(s) of the shaping portion(s), the surface of the mold release film serving as the transfer molding surface.

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5. A method of producing a mold having a transfer molding surface of a predetermined shape and is used for press-molding a shaping material into a optical element fixing member, wherein alignment mark transfer portion(s)

15 is/are formed by dry-etching on the mold material so as to be positioned on the transfer molding surface of the mold in order to obtain a optical element fixing member and having the alignment mark(s).

20 6. A optical element fixing member, wherein alignment mark(s) for determining a positional relationship relative to other member(s) is/are integrally molded, and the alignment mark(s) have a surface roughness which is different from a surface roughness on the periphery of the

25 alignment mark(s).

7. A optical element fixing member according to claim 6, wherein the member comprises a glass.

5           8. A method of producing a mold having a transfer molding surface constituted by a plurality of transfer patterns and is used for press-molding a shaping material into an article of a predetermined shape, wherein alignment mark(s) is/are formed on a mold material by dry-etching, and  
10 the mold material is worked using the alignment mark(s) as reference(s) in order to form the transfer molding surface constituted by the plurality of transfer patterns.

          9. A method according to claim 8, wherein a rare  
15 gas, a simple gas of the CF type or a simple gas of the Cl type is/are used as the etching gas(es) at the time of forming the alignment mark(s) by dry-etching.

          10. A method of producing a mold having a transfer  
20 molding surface constituted by a plurality of transfer patterns and is used for press-molding a shaping material into an article of a predetermined shape, wherein alignment mark(s) is/are formed on a mold material by dry-etching, the mold material is worked by using the alignment mark(s) as  
25 reference(s) in order to form a transfer molding bare

surface constituted by bare transfer patterns that serve as bases for the transfer patterns, and a mold release film is formed so as to cover at least the transfer molding bare surface, the surface of the mold release film serving as a transfer surface.

11. A method according to claim 10, wherein a single kind of gas or plural kinds of gases selected from the group consisting of a rare gas, a simple gas of the CF type and a simple gas of the Cl type is/are used as the etching gas(es) at the time of forming the alignment mark(s) by dry-etching.

12. A mold comprising a base member having a transfer molding bare surface of a predetermined shape formed by dry-etching, and a mold release film formed on the transfer molding bare surface so as to reflect the shape of the transfer molding bare surface, the surface of the mold release film serving as a transfer molding surface.

13. A mold according to claim 12, wherein the base member comprises (1) a hard material containing WC, or (2) a cermet containing TiN, TiC or  $Al_2O_3$ .

14. A mold according to claim 12, wherein transfer pattern(s) corresponding to rugged pattern(s) of a

diffraction element, is/are formed on the transfer molding surface.

15           15.   A mold having a transfer molding surface formed  
on the mold material by dry-etching.

16.   A mold according to claim 15, wherein the mold comprises amorphous carbon.

10           17    A mold according to claim 15, wherein transfer  
pattern(s) corresponding to rugged pattern(s) of a  
diffraction element, is/are formed on the transfer molding  
surface.

15           18.   A method of producing a mold by obtaining a base  
member by forming, on the mold material by dry-etching, a  
transfer molding bare surface that serves as a base for the  
transfer molding surface, and forming a mold release film on  
the transfer molding bare surface so as to reflect the shape  
20 of the transfer molding bare surface, the surface of the  
mold release film serving as a transfer molding surface.

19.   A method according to claim 18, wherein, in  
obtaining a base member by forming a transfer molding bare  
25 surface on a mold material by dry-etching by using, as the

mold material, either (1) a hard material containing WC or  
(2) a cermet containing TiN, TiC or  $Al_2O_3$ , use is made, as  
etching gas(es), of a single kind of gas or plural kinds of  
gas(es) selected from the group consisting of a rare gas, a  
5 simple gas of the carbon fluoride type and a simple gas of  
the chlorine type.

20. A method according to claim 18, wherein there is  
formed a transfer molding base surface having rugged  
10 pattern(s) corresponding to rugged pattern(s) of the  
diffraction element.

21. A method of producing a mold by forming a  
transfer molding surface on a mold material by dry-etching.  
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22. A method according to claim 21, wherein, in  
forming a transfer molding surface on a mold material by  
dry-etching by using amorphous carbon as the mold material,  
use is made of a rare gas, a simple gas of the carbon  
20 fluoride type or a simple gas of the chlorine type as  
etching gas(es).

23. A method according to claim 21, wherein there is  
formed a transfer molding surface having transfer pattern(s)  
25 corresponding to rugged pattern(s) of a diffraction element.

24. A method of producing a diffraction element of a glass relying upon the press-molding by using a set of molds including the mold of claim 12 or claim 15 as an upper mold  
5 or as a lower mold.